



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,568	02/17/2006	Christian Friedrich	05-348	7453
34704 7590 10/30/2007 BACHMAN & LAPOINTE, P.C. 900 CHAPEL STREET SUITE 1201 NEW HAVEN, CT 06510			EXAMINER RAHMAN, FAHAD	
			ART UNIT 4175	PAPER NUMBER
			MAIL DATE 10/30/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/534,568

Applicant(s)

FRIEDRICH, CHRISTIAN

Examiner

FAHAD RAHMAN

Art Unit

4175

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

*Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 5/12/05.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Williams (US 4,510,894).

3. Regarding claim 1, Williams discloses a compensating shaft 180 for reciprocating piston engines comprising at least one compensating weight 181 (see col. 27, lines 60-63; and Fig. 30) with an eccentric center of gravity (see col. 27, lines 60-63; and Fig. 30), the compensating weight 181 being connected torsionally elastically to the compensating shaft 180 (see col. 27, lines 64-68), wherein the compensating weight 181 surrounds the compensating shaft 181 with its edge zones and a window is formed therebetween in the longitudinal direction, in which an elastic element is provided (see col. 27, lines 64-68), which is supported on the compensating shaft in the circumferential direction.

Regarding claim 7, Williams discloses a compensation shaft 180 for a reciprocating piston engine, said compensation shaft 180 comprising: a compensation weight 181 (see col. 27, lines 60-63; and Fig. 30) having an eccentric center of gravity (see col. 27, lines 60-63; and Fig. 30) and a longitudinal window; a shaft 180 supporting said compensation weight 181 and having a variable rotational speed (see col. 27, lines

Art Unit: 4175

64-68); and a damping member (see col. 27, lines 64-68) disposed within said window and elastically coupling said compensation weight 181 and said shaft 180 (see col. 27, lines 64-68) and said shaft 181 enabling said rotation between said shaft 181 and said compensation weight 180 when said rotational speed of said shaft changes (see col. 27, lines 64-68).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 2-4, 8-18, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams (US 4,510,894) as applied to claims 1 and 7 above, and further in view of McGovern et al. (US 4,913,517).

7. As discussed above, Williams discloses the invention substantially as claimed however, regarding claims 2-4 and 13, Williams does not disclose the compensating shaft wherein the elastic element is a spring damper unit; or that the elastic element is

Art Unit: 4175

made of plastic, and further wherein the elastic element is made of plastic of elasticity which is graduated in the circumferential direction, including a hard central part interconnecting with the compensating shaft which is firm in the circumferential direction, and a soft part bearing against the compensating weight.

McGovern et al. discloses a compensating shaft wherein the elastic element is a spring damper unit 54 or that the elastic element 100 is made of plastic (see col. 4, lines 1 and 2). McGovern further discloses the elastic element made of a plastic of elasticity which is graduated in the circumferential direction (see col. 3, line 68; and see col. 4, lines 1-4), including a hard central part 98 interconnecting with the compensating shaft 92 which is firm in the circumferential direction, and a soft part 100 bearing against the compensating weight. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the shaft of Williams with the compensating shaft taught by McGovern et al. wherein the elastic element is a spring damper unit; or that the elastic element is made of plastic, wherein the elastic element is made of plastic of elasticity which is graduated in the circumferential direction, including a hard central part interconnecting with the compensating shaft which is firm in the circumferential direction, and a soft part bearing against the compensating weight in view of the teaching of McGovern et al. in order to provide for relative rotation between the inner and outer shafts. Doing so would allow the shaft of Williams to have vibration control of the system since the outer shaft would be allowed to swing freely. This would be a desirable combination which would reduce the movement of the inner shaft off of the rotational axis.

Regarding claim 8, Williams does not disclose the compensation shaft wherein the elastic element is a spring damper.

McGovern et al. discloses the compensation shaft wherein the elastic element is a spring damper 54. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the shaft of Williams with the compensation shaft wherein the elastic element is a spring damper in view of the teaching of McGovern et al. in order to provide for relative rotation between the inner and outer shafts. Doing so would allow the shaft of Williams to have vibration control of the system since the outer shaft would be allowed to swing freely. This would be a desirable combination which would reduce the movement of the inner shaft off of the rotational axis.

Regarding claims 9 and 12, Williams discloses a plurality of compensation weights 181 (see Fig. 30).

Williams does not disclose the spring damper being a plurality of spring dampers disposed around a perimeter of said shaft.

McGovern et al. disclose a plurality of springs 100F disposed around the perimeter of said shaft 70. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the shaft of Williams with the plurality of spring dampers in view of the teaching of McGovern et al. in order to provide for torsion at multiple locations, even with the occurrence of damage to one spring.

Regarding claim 10, Williams does not disclose the spring damper including a spring having a first end connected with a shaft and a second end connected to a

compression weight, said spring biasing relative rotation between said shafts and compensation weights.

McGovern et al. discloses the spring damper 54 including a spring (see col. 7, line 31) having a first end connected with a shaft and a second end connected to a compression weight, said spring 54 biasing relative rotation between said shafts and compensation weights (see col. 7, lines 31-32). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the shaft of Williams with the spring damper including a spring having a first end connected with a shaft and a second end connected to a compression weight, said spring biasing relative rotation between said shafts and compensation weights in view of the teaching of McGovern et al. in order to provide for relative rotation between the two shafts. Doing so would allow the shaft of Williams to have vibration control of the system since the outer shaft would be allowed to swing freely. This would be a desirable combination which would reduce the movement of the inner shaft off of the rotational axis.

Regarding claim 11, Williams does not disclose a stop having a first end fixed to a shaft and a second end and communication therebetween said second end and a compensation weight limiting relative rotation between said compensation weight and a shaft when the rotational speed of said shaft changes.

McGovern et al. discloses a stop 100D for limiting rotation. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the shaft of Williams with the stop in view of the teaching of McGovern et al. in order to limit rotation under certain conditions.

Regarding claim 14, Williams discloses the compensation weight 181 having a closed cylindrical contour (see Fig. 30).

Regarding claim 15, Williams discloses a damping member 181 coupled to said shaft 180 (see Fig. 30).

Regarding claims 16 and 17, Williams does not disclose a second portion of the damping member disposed between first portion and a compensation weight having a second elasticity.

McGovern et al. discloses a second portion of the damping member 98 that can be disposed between the first portion 181 (Williams) and a compensation weight 181 (Williams), wherein different shells of the damping mechanism have different elasticities (see col. 4, lines 37-59). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the shaft of Williams with the damping member and different elasticities in view of the teaching of McGovern et al. in order to allow for additionally variable dampening.

Regarding claims 18, 20, and 21, Williams discloses a metal thin walled cylindrical sleeve 227 which can be used as a metal reinforcement for a protrusion, a shaft 180, and a compensating weight 181.

Williams does not disclose an aperture and protrusion, said aperture receiving said protrusion and coupling said compensation weight to said shaft.

McGovern et al. discloses an aperture 92a and protrusion 98a, said aperture 92a receiving said protrusion 98a. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the shaft of Williams with the

Art Unit: 4175

aperture-protrusion system in view of the teaching of McGovern et al. in order to be able to provide a mode of communication between the shaft and compensation weight for the purpose of noise reduction.

8. Claims 5, 6, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams (US 4,510,894) in view of McGovern et al. (US 4,913,517) as applied to claims 4 and 18 above, and further in view of Fox et al. (US 4,282,836).

9. Regarding claims 5 and 6, Williams as modified by McGovern et al. discloses a root 98a (McGovern et al.) projecting into a transverse bore 92a (McGovern et al.) of the shaft 92 (McGovern et al.) for interconnection therewith, and a metal thin walled cylindrical sleeve 227 (Williams) which can be used as a metal reinforcement for the root 98a (McGovern et al.).

Williams as modified by McGovern et al. do not disclose the plastic part being manufactured by injection molding.

Fox et al. disclose a lightweight shaft 6 which can be formed from conventional injection molding methods (see col. 2, lines 47-49). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the shaft of Williams as modified by McGovern et al. with the injection molding method in view of the teaching of Fox et al. as injection molding is the most common method of production.

Regarding claim 19, Williams as modified by McGovern et al. do not disclose manufacturing the portions and protrusion via injection molding.

Art Unit: 4175

Fox et al. discloses a lightweight shaft 6 which can be formed from conventional injection molding methods (see col. 2, lines 47-49). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the shaft of Williams as modified by McGovern et al. with the injection molding method in view of the teaching of Fox et al. as injection molding is the most common method of production.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FAHAD RAHMAN whose telephone number is (571) 270-3511. The examiner can normally be reached on MONDAY THROUGH THURSDAY 7:30AM - 5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, TERRENCE R. TILL can be reached on (571) 272-4536. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 4175

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Terrence R. Till
Supervisory Patent Examiner

FR
FR